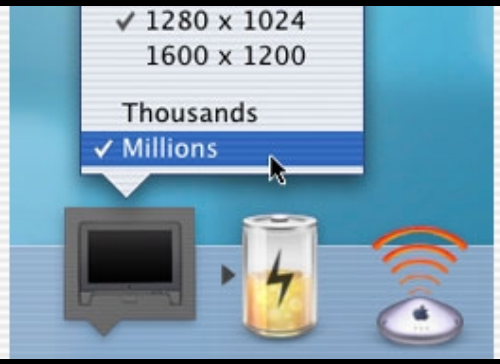
Session 100

Mac OS X Update



Ken Bereskin
Director, Mac OS Marketing

10 Great Things About

Bertrand Serlet
VP Platform Technologies

1 Architecture

Aqua

Frameworks

Graphics

Darwin

Aqua

Frameworks

Graphics

Darwin

Using the Core OS

- Through toolboxes Carbon, Cocoa, Java
- Through Posix APIs
  - Terminology: Unix, BSD, Posix APIs
- “Scripting” via shell commands
- Mach APIs

Extending the Core OS

- Kernel extensions
  - Drivers via I/O Kit
  - FileSystems, networking protocols, . . .
- Experts only!
- Open Source
  - About 100,000 registrations
  - External submissions in 10.0.3!

Aqua

Frameworks

Graphics

Darwin

Aqua

Frameworks

Graphics

Darwin

Aqua

Frameworks

Quartz | OpenGL | QuickTime

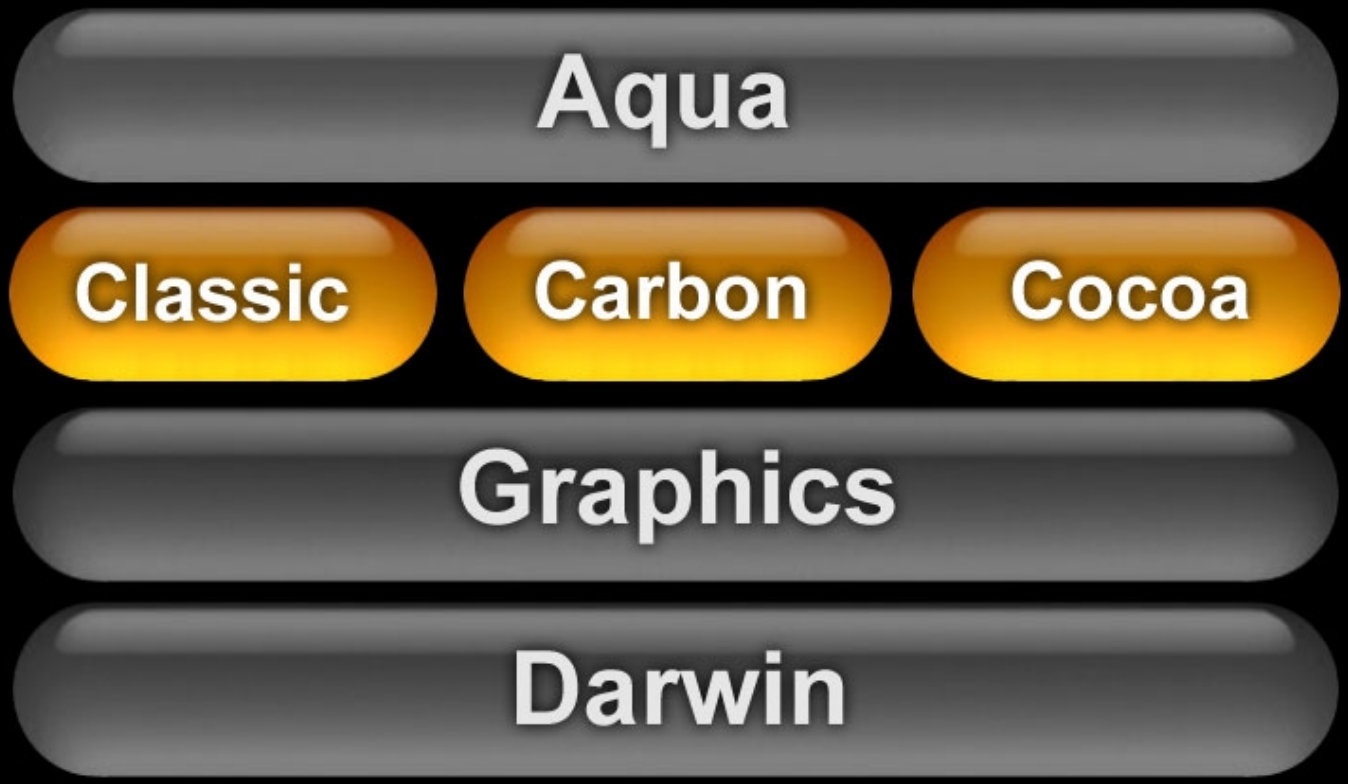
Darwin

Aqua

Frameworks

Graphics

Darwin


Aqua
Classic
Carbon
Cocoa
Graphics
Darwin

Aqua

Frameworks

Graphics

Darwin

Finder File Edit View Go Window Help
11:23 AM
Documents
Back
View
Computer
Home
Favorites
Applications
My Project
Homework
Ladybug
Star Fish
MP3
Jazz
Read me
QuickTime Player
00:12:23
untitled document
Save as: Flowers
Where: Documents
Save Image Preview
Cancel
Save
TextEdit
pdf

1.0

?

Reuse System Applications

- Leverage system apps via:
  - Specific APIs
  - Services menu (Cocoa apps)
  - AppleEvents
  - AppleScript

Aqua

Frameworks

Graphics

Darwin

A Great Architecture

- Layered — to manage complexity
- Clear boundaries — stability
- Modern — internet and multimedia at its center
- No compromise — even for Classic
- Scalable
  - Base for Mac OS X Server
  - Can evolve a decade or two

A great basis for innovation — for all of us

Roadmap

115 Open Source at Apple	Room A2 **Wed., 10:30am**
101 Frameworks Overview	Hall 2 **Mon., 3:30pm**
107 2D Graphics Using Quartz	Room A1 **Tues., 10:30am**
111 Make it Aqua	Hall 2 **Wed., 10:30am**

2 I/O Kit

Object Oriented framework to ease development of drivers

I/O Kit

- Models physical world
- All the basic families encapsulated
  - Families abstract protocols
  - Drivers access the hardware
- Features
  - True plug and play
  - Supports SMP
  - Sophisticated power management

Why Does It Wake Up So Fast?

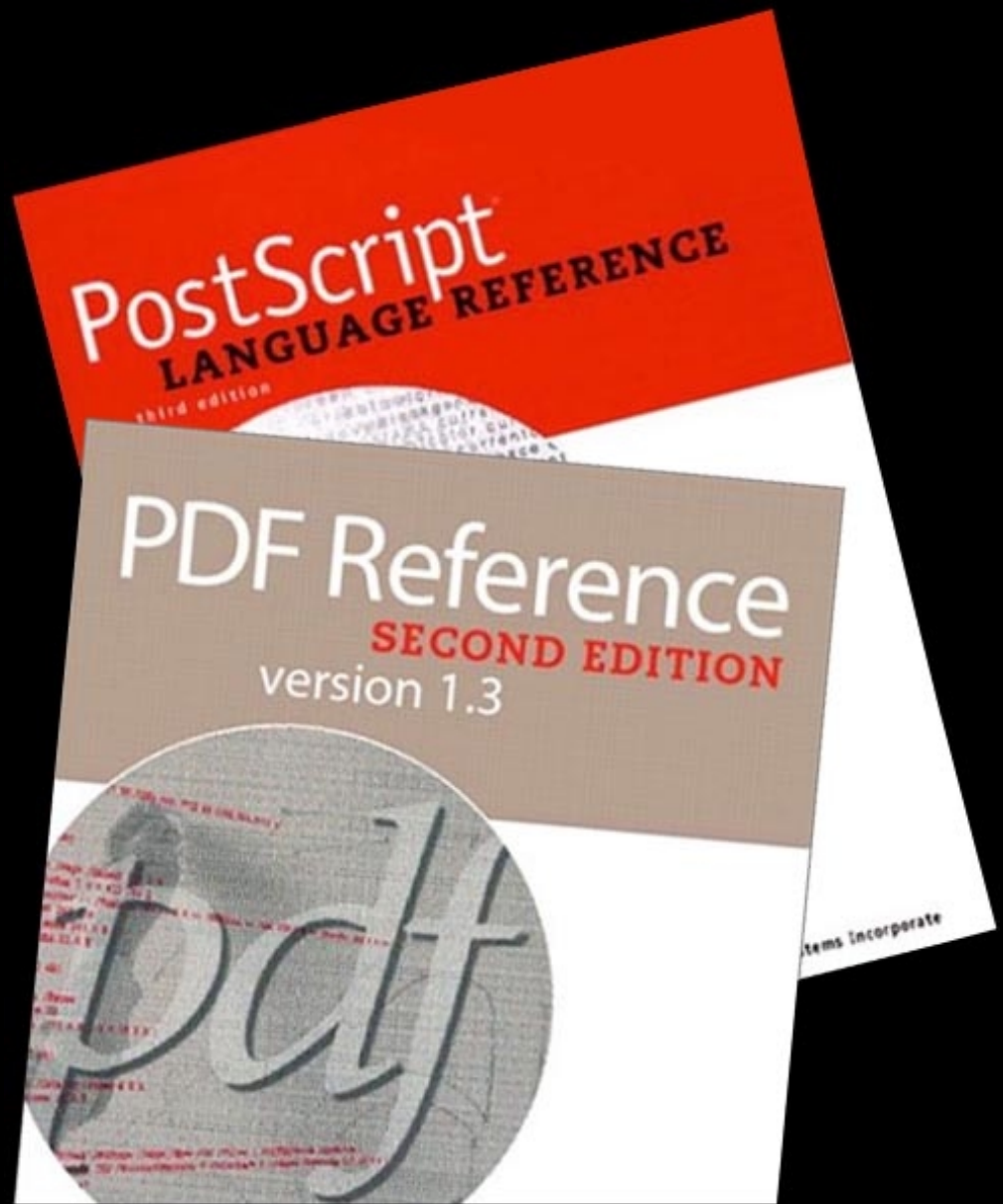
- Concept of “power plane” mapping to HW
- Leverage multithreading
- Lazy propagation of state changes

Shows value of making the whole widget

Roadmap

104 I/O Kit Update	Room A1 **Mon., 3:30pm**
202 FireWire Overview	Room A2 **Tues., 2:00pm**
203 USB Overview	Room A2 **Tues., 3:30pm**
204 I/O Kit: Storage Drivers	Room A2 **Tues., 5:00pm**

3 Portable Document Format (PDF)



PDF Page Content

Adobe Type 1
TrueType
OpenType

Outline Fonts

Sampled Images

Vector Line Art

PDF for Your Application

- PostScript imaging: pro graphics for your app
- Save as PDF — for FREE
- What you see is what you'll print — for FREE
- All font formats
- ICC Profiles (ColorSync)

- For PDF Files: Graphics Importer, NSImage

Roadmap

108 PDF, Quartz & Mac OS X	Room J2 **Tues., 9:00am**
107 2D Graphics Using Quartz	Room A1 **Tues., 10:30am**
124 Printing	Room A2 **Thurs., 3:30pm**

4 Great Developer OS

Great Developer OS

- Switch seamlessly between “use” and “develop”
  - Live and develop on one machine
- Tools built-in
  - Shipped with each copy of Mac OS X!
  - Broad spectrum of tools
  - Performance tools

Develop on the Road

- Power management + mobility + Airport

5 Global Features

Application Packaging

- Single Binary Multiple Languages (SBML)
  - For the user: one icon
  - For the developer: files / folders
- All you need to run the app
  - Resources
  - Help, templates, . . .
- Applies to apps, libraries, plug-ins, . . .

Unicode

- Unicode throughout
  - CoreFoundation defines CFString
  - POSIX layer uses UTF8
- Fonts span Unicode character set
- Unicode Text controls
  - MLTE for Carbon
  - NSText for Cocoa

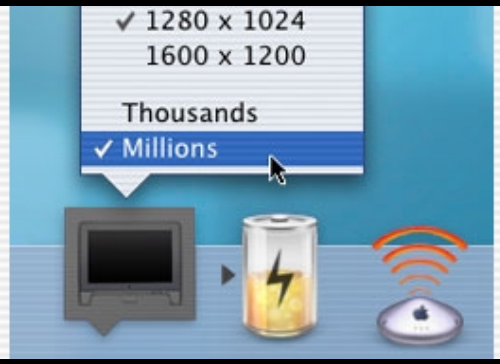
App Packaging + Unicode

- Mac OS X in 7 languages
- Soon: Chinese, Korean, European languages
- Easy to have your app ‘SBML’
  - App packaging
- Easy to internationalize support
  - Unicode throughout

Roadmap

114 Application Packaging	Hall 2 **Wed., 5:00pm**
129 Application Localization	Room C **Thurs., 3:30pm**
138 Core Foundation	Civic **Fri., 9:00am**

Demo



Tony O'Brien
Manager, Mac OS X Integration

6 XML Everywhere

XML Everywhere

- Preferences
- App packaging
- Plug-ins
- Drivers
- Pasteboard

All configuration files!

XML Everywhere

- Reusable XML parser
  - CoreFoundation
  - Foundation
  - Darwin
- Data driven when possible

Embrace Open Standards

IEEE 802.11	PPP
Kerberos	PPoE
LDAPv3	SSL
NFS	DHCP
AFP	BootP
TCP	POP
UDP	IMAP4
ICMP	SMTP
SLP	HTTP
NNTP	FTP

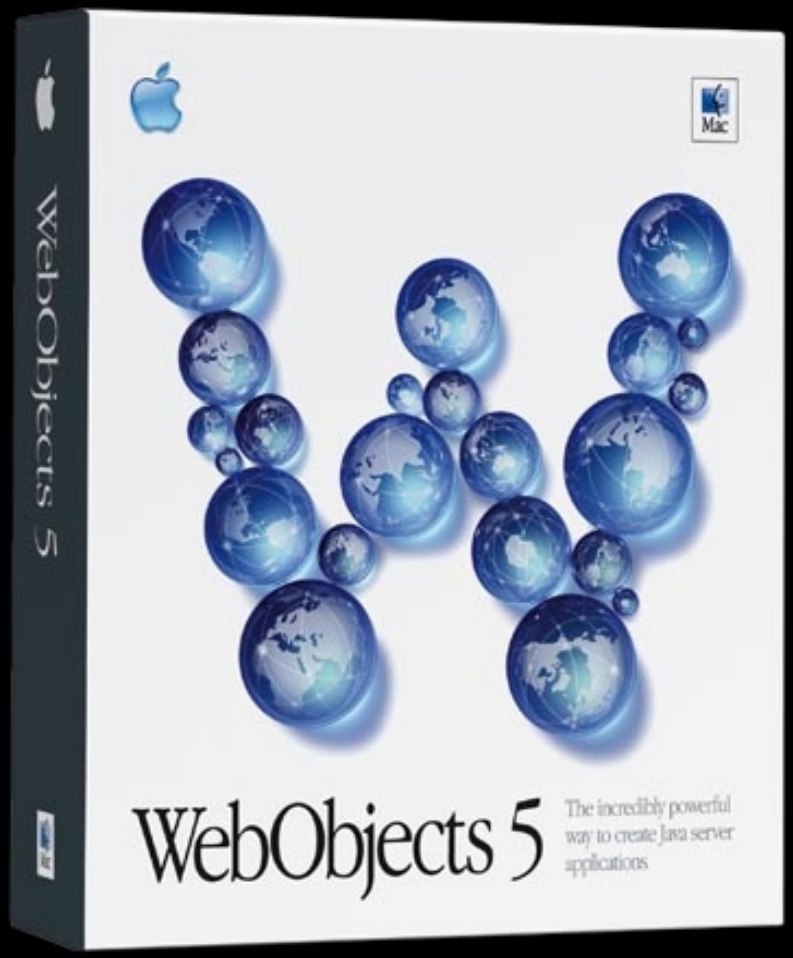
7

A Great Java 2 Platform

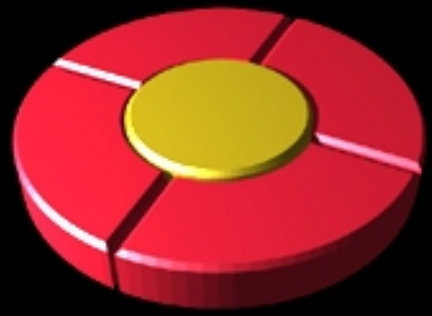
Java

- HotSpot Java VM
- For cross-platform applications
- Extra benefits from X
  - QuickTime
  - Apps have Aqua look and feel
- Coming soon: Java Update for applets and apps

WebObjects 5



- Cross-platform
- Best developed and deployed on Mac OS X
- Business logic in Java



Roadmap

500 Java Overview	Hall 2 **Tues., 9:00am**
600 WebObjects: State of the Union	Civic **Mon., 3:30pm**
601 WebObjects: Technical Overview	Civic **Mon., 5:00pm**

8 Performance Tools

Performance Tools: Motivation

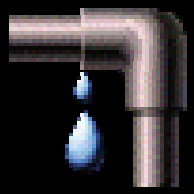
- Darwin: extremely fast fundamentals
- Powerful primitives: VM, tasks, threads, …

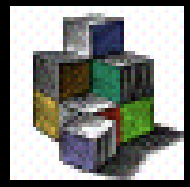
But:

Carbon has different performance characteristics on Mac OS 9 and X

  - e.g., DragWindow
  - e.g., LowMems

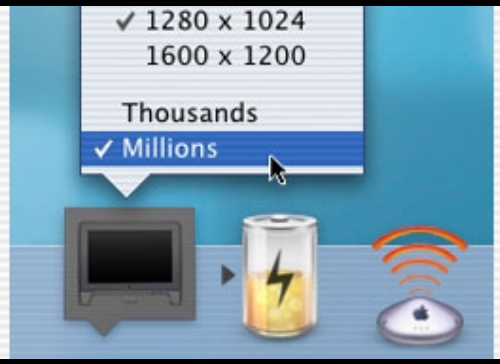
Performance Tools





- Included on Developer CD
- GUI and command-line tools
- No recompilation!
- Analyze and optimize
  - Memory use / execution patterns / drawing
  - System behavior
- Book on performance

Demo



Robert Bowdidge
Development Tools

Roadmap

121 Carbon Performance Tuning	Hall 2 **Thurs., 2:00pm**
705 Apple Performance Tools	Room A2 **Thurs., 5:00pm**

Great Frameworks

Aqua

Frameworks

Graphics

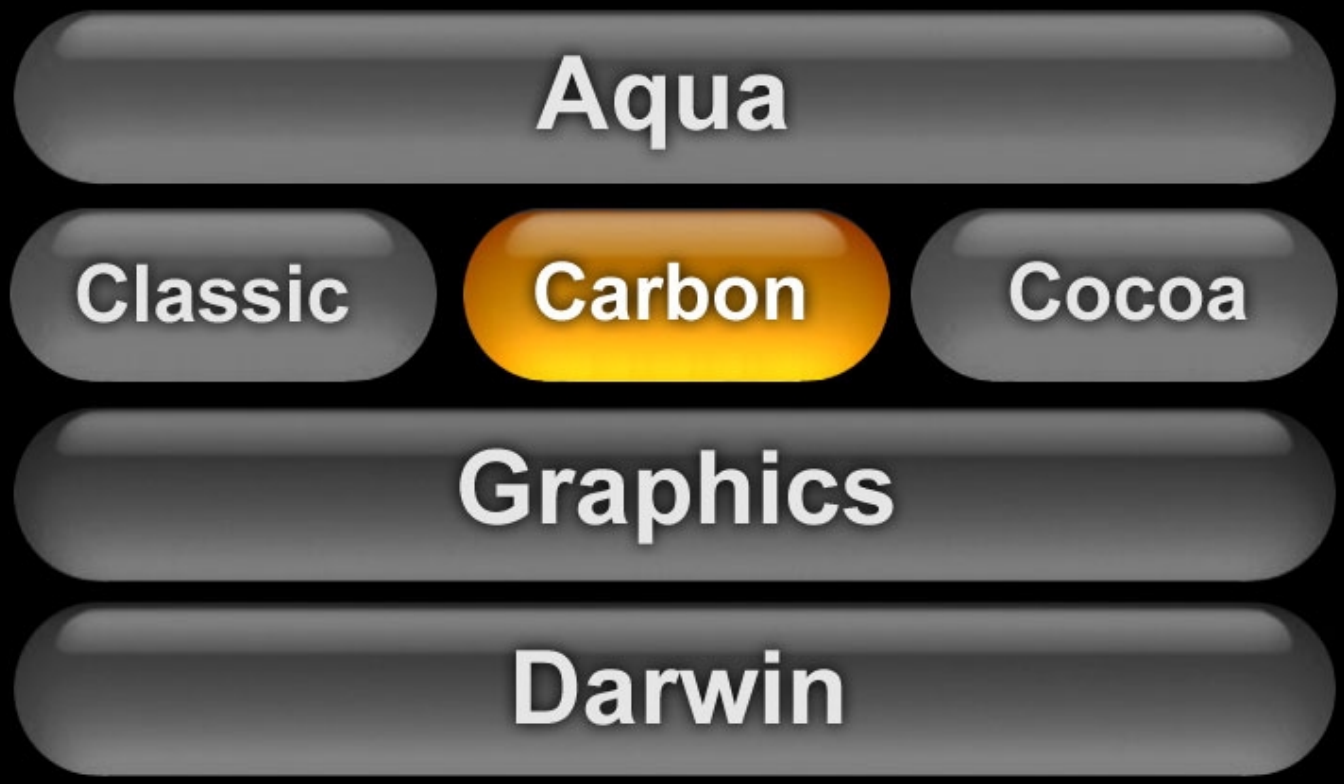
Darwin

Aqua

Classic | Carbon | Cocoa

Graphics

Darwin


Aqua
Classic
Carbon
Cocoa
Graphics
Darwin

Carbon

- Challenge: Traditional Mac Toolbox onto modern underpinnings
  - Designed before HFS+, QuickTime, Unicode, …
  - Ran in own address space
  - Different low-level services: Networking, FS, …
- Goals
  - Tune up needed, not rewrite
  - Modernize (e.g., NavServices, Unicode)
  - Provide tools (e.g., CarbonDater)

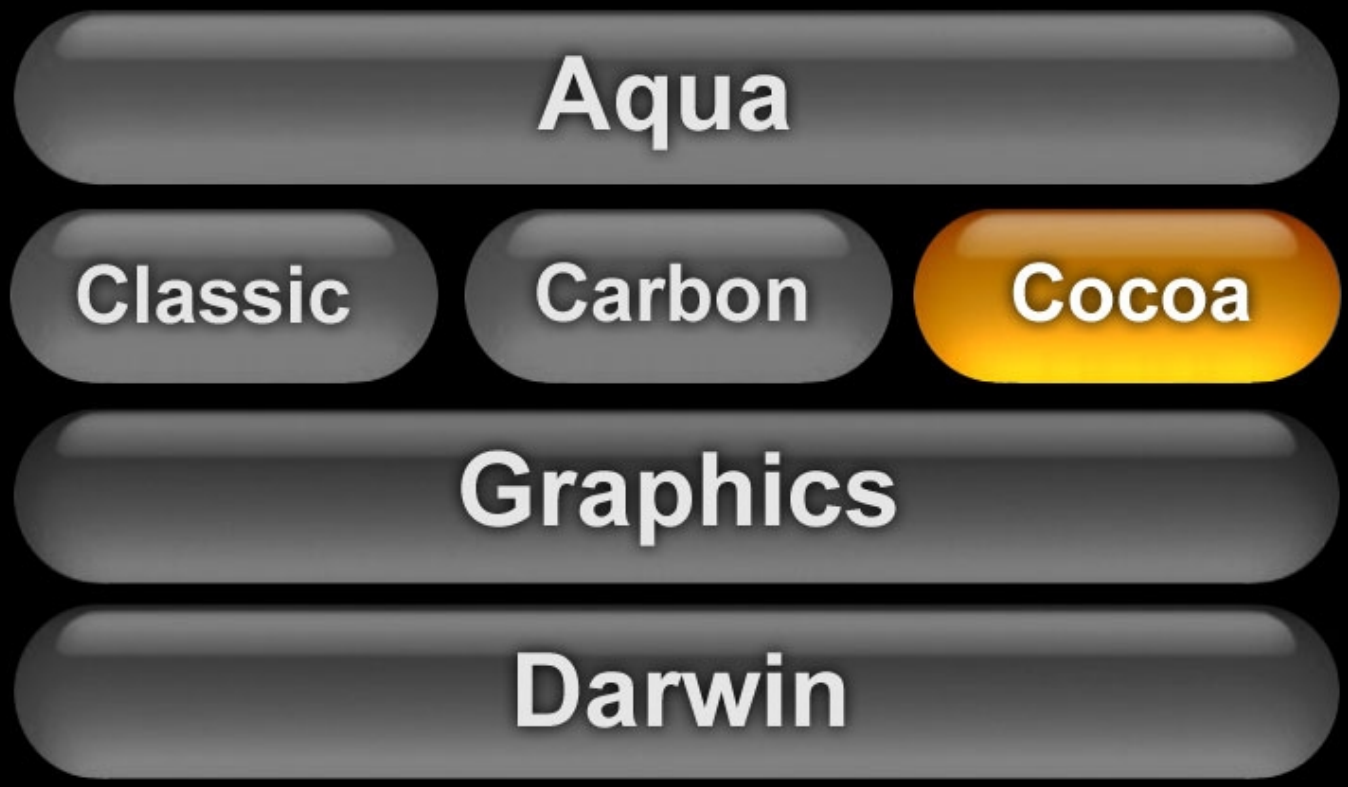
Carbon: What We Learned

- Layering a challenge
  - Disentangle layers took a long time
- Compatibility of API semantics very good
  - First bringup easy

Carbonization not enough: performance tuning needed

Roadmap

101 Frameworks Overview	Hall 2 **Mon., 3:30pm**
106 Carbon Event Manager	Hall 2 **Tues., 5:00pm**
119 Carbon Controls	Hall 2 **Thurs., 9:00am**
121 Carbon Performance Tuning	Hall 2 **Thurs., 2:00pm**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Cocoa
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Cocoa

- What is Cocoa?
  - Full featured toolbox
  - Object Oriented
  - RAD — start with UI — invert dev cycle model
- Two layers
  - Foundation: non-UI classes
  - AppKit: UI classes

Foundation: Non-UI Classes

- Lego-like: everything fits nicely together
- Few concepts, constantly reused
- String, Data, collections, XML …
- Task, Thread, …

AppKit—UI Classes

- Rich set of controls
- Model-View-Controller
- Low Level: Buttons, Windows, …
- High Level: Text, OutlineView, Toolbar…
- Fully Leverage Foundation

Why Cocoa?

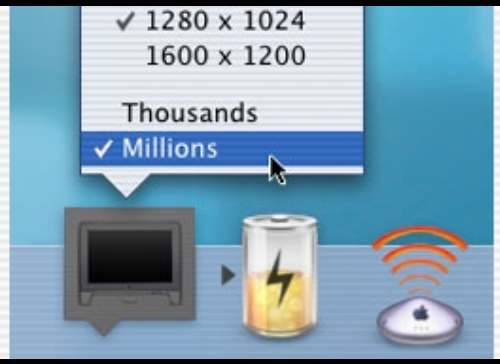
- Mail: 75,000 lines
  - A full-featured mail application
- TextEdit: 3,000 lines
  - A fairly sophisticated word processor
- TextEdit50: 50 lines
  - A reasonable text editor

Cocoa: a lot for FREE!

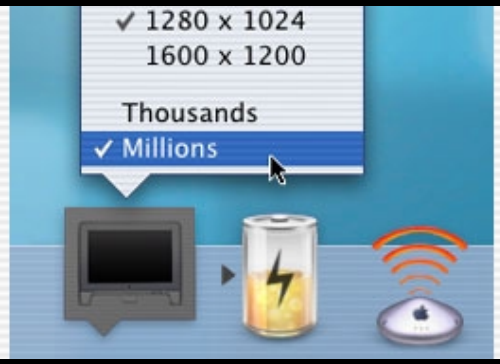
Roadmap

101 Frameworks Overview	Hall 2 **Mon., 3:30pm**
102 Cocoa Overview	Hall 2 **Mon., 5:00pm**
122 Using Cocoa	Hall 2 **Thurs., 3:30pm**

C.K. Haun
Director, Worldwide Developer Technical Services



Vince Parsons
Acrobat Engineering
Adobe, Inc.



Lorin Rivers
Real Basic Product Manager
Real Software, Inc.

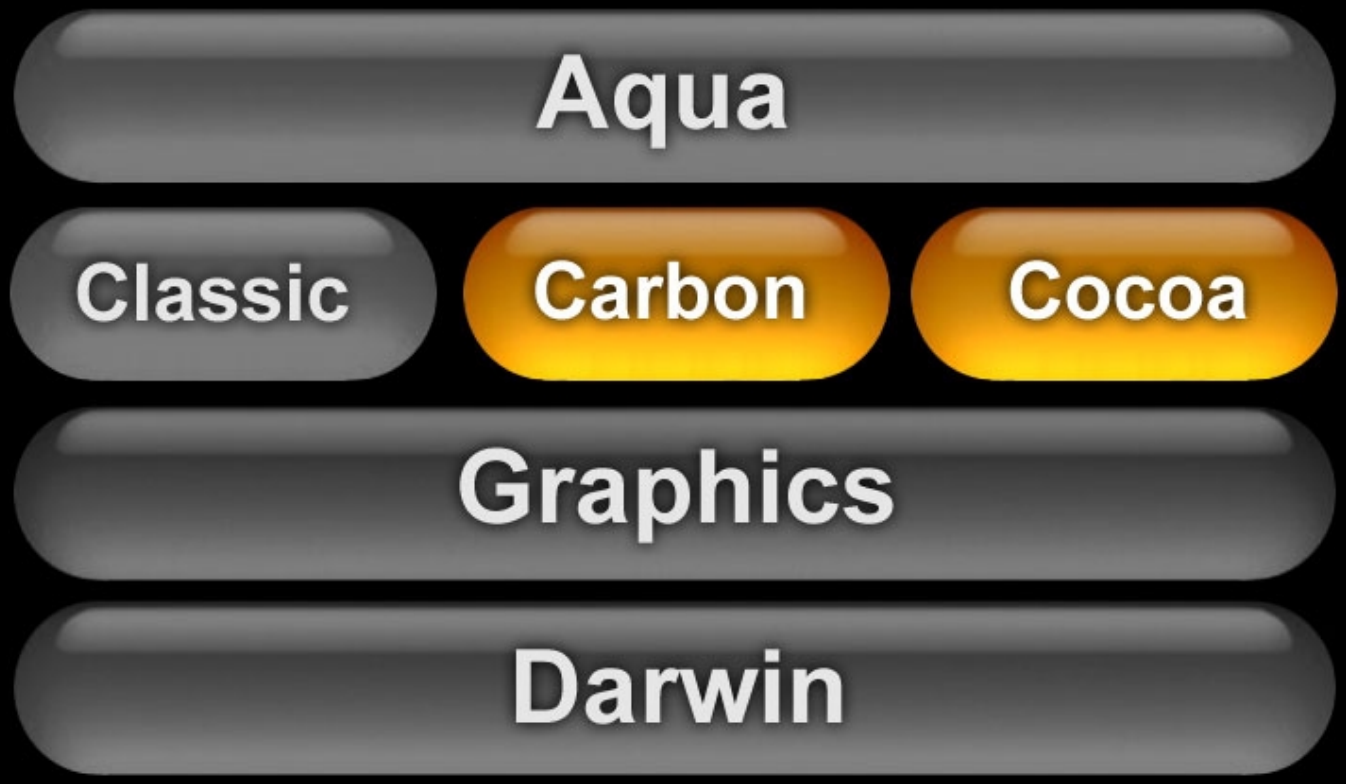
Eric Wittman
Director of Flash and Freehand Management
Macromedia, Inc.

Andrew Stone
President
Stone Design Corp.

Marc Parmet
VP Marketing and Business Development
Meeting Maker, Inc.

Wil Shipley
President
The Omni Group

Graeme Devine
Designer, Lead Mac Programmer
id Software, Inc.


Aqua
Classic
Carbon
Cocoa
Graphics
Darwin

10

Aqua

Finder File Edit View Go Window Help
11:23 AM
Documents
Back View Computer Home Favorites Applications My Project
Homework
Ladybug
Star Fish
Jazz
Read me
QuickTime Player
untitled document
Save as: Flowers
Where: Documents
Save Image Preview
Cancel
Save
TextEdit

Aqua

The most visible "great" thing about X

- Big selling point for your app
- Basic Aqua support for free
  - Carbon, Cocoa, even Java
- Advanced Aqua easy (e.g., sheets)
- UI Guidelines
  - InterfaceBuilder to help follow the guidelines

10 Great Things About Mac OS X

- Architecture
- I/O Kit
- PDF
- Great Developer OS
- Global Features
- XML
- Java
- Performance Tools
- Frameworks
- Aqua

There's a Lot of Great Things About Mac OS X

- It shipped March 24
- Pre-installed, ahead of schedule
- Already a number of applications
- Lots more this summer!

The ball is in your court

But we are here to help you!

WWDC

Worldwide Developers Conference 2001

WWDC

Worldwide Developers Conference 2001

WWDC

Worldwide Developers Conference 2001